

Chemical Analysis Report

BMR-TAMPA-2021-04-06-03

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Piney Point April Effluent Sample**

Request ID: **RQ-2021-04-05-74**

Customer: **BMR-TAMPA**

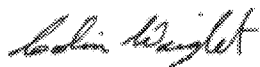
Project ID: **PINEYPOINT**

Send Reports to:
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637
Attn: Vishwas Sathe

For additional information please contact
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Dr. rer. nat. Bettina Steinbock
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Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 12-APR-2021 17:47



NON-CONFORMANCE REPORT INCLUDED

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: $1.3E+03$, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Piney Point

Collection Date/Time: 04/05/2021 15:30

Field ID: EFFLUENT

Matrix: W-EFFLUENT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2236660	EPA 180.1 Rev. 2.0	Turbidity	3.9	A	NTU	P396024	
	EPA 300.0 Rev. 2.1	Chloride	5.1E+03	A	mg Cl/L	P396035	
		Sulfate	3.2E+03	A	mg SO4/L	P396037	
	SM 2540 D-2011	TSS	9	I	mg/L	P396104	
	SM 4500 F-C-2011	Fluoride	1.9		mg F/L	P396152	
2236661	EPA 350.1 Rev. 2.0	Ammonia-N	220	Y	mg N/L	P396026	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	220	Y	mg N/L	P396066	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	IY	mg N/L	P396061	
	EPA 365.1 Rev. 2.0	Total-P	140	Y	mg P/L	P396034	
2236662	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	130	Y	mg P/L	P396004	
2236663	EPA 200.7 Rev. 4.4	Calcium	282	Y	mg/L	P396106	
		Chromium	5.3	Y	ug/L	P396106	
		Iron	150	Y	ug/L	P396106	
		Magnesium	465	Y	mg/L	P396106	
		Manganese	153	Y	ug/L	P396106	
		Potassium	189	Y	mg/L	P396106	
		Sodium	3.50E+03	Y	mg/L	P396106	
		Strontium	3.20E+03	Y	ug/L	P396106	
		Tin	60	UY	ug/L	P396106	
		Titanium	0.75	UY	ug/L	P396106	
		Vanadium	2.0	UY	ug/L	P396106	
		Zinc	14	IY	ug/L	P396106	
	EPA 200.8 Rev. 5.4	Aluminum	144	Y	ug/L	P396106	
		Antimony	0.20	UY	ug/L	P396106	
		Arsenic	22.7	Y	ug/L	P396106	
		Beryllium	0.10	UY	ug/L	P396106	
		Boron**	1.60E+03	Y	ug/L	P396106	
		Cadmium	0.080	UY	ug/L	P396106	
		Cobalt	1.96	Y	ug/L	P396106	
		Copper	1.6	UY	ug/L	P396106	
		Lead	0.80	UY	ug/L	P396106	
		Molybdenum	0.60	UY	ug/L	P396106	
		Nickel	19.5	Y	ug/L	P396106	
		Selenium	0.80	UY	ug/L	P396106	
		Silver	0.040	UY	ug/L	P396106	
		Thallium	0.40	UY	ug/L	P396106	
		Uranium**	0.028	IY	ug/L	P396106	

Field ID: EFFLUENT

Matrix: W-EFFLUENT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample. The sample was received unpreserved: pH > 2. Sample preserved in laboratory.

EPA 353.2 Rev. 2.0: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample. The sample was received unpreserved: pH > 2. Sample preserved in laboratory.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Sample was received un-filtered. It was filtered in the laboratory prior to analysis.

EPA 200.7 Rev. 4.4: The sample was received unpreserved: pH > 2. The sample had to be separated into aliquots prior to preservation in the laboratory. Batch matrix spike recoveries for calcium, magnesium, potassium, sodium and strontium are unavailable because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The sample was received unpreserved: pH > 2. The sample had to be separated into aliquots prior to preservation in the laboratory. Batch matrix spike recoveries for boron are unavailable because of high analyte concentration in the QC sample.

Non-Conformance Report

NCR ID: 8759

<u>Event(s)</u>	<u>Job(s)</u>	<u>Sample(s)</u>	<u>Test(s)</u>
BMR-TAMPA-2021-04-06-03	TLH-2021-04-06-55	2236658	
BMR-TAMPA-2021-04-06-03	TLH-2021-04-06-55	2236659	
BMR-TAMPA-2021-04-06-03	TLH-2021-04-06-56	2236661	
BMR-TAMPA-2021-04-06-03	TLH-2021-04-06-57	2236663	

NCR Type: SHIPPING/RECEIVING

NCR Category: Preservation Not Intact

Observation: Sample(s) not preserved to pH < 2.

Sample arrived in a one-gallon jug; chemistry supervisors split the sample to smaller bottles according to the RQ instructions.

The aliquots taken for preserved chemistries were acidified with H₂SO₄ (preserved Nutrient) & HNO₃ (preserved Metals and overflow).

Resolution: Metals and overflow samples were preserved in the laboratory with nitric acid 04/06/2021 at 13:35.
HNO₃ Lot# NA0344060 | Expiration Date: 01/04/2022.

Nutrient sample preserved in the laboratory with sulfuric acid 04/06/2021 at 13:30.
H₂SO₄ SER# 119559 | Expiration Date: 09/18/2021.

Authorized by/Date: Joshua Ayres 4/9/2021

NCR ID: 8760

<u>Event(s)</u>	<u>Job(s)</u>	<u>Sample(s)</u>	<u>Test(s)</u>
BMR-TAMPA-2021-04-06-03	TLH-2021-04-06-56	2236662	

NCR Type: SHIPPING/RECEIVING

NCR Category: Sample not field-filtered

Observation: The W-PO₄-F sample was not field filtered.

Resolution: Data will be qualified as appropriate.
Chemistry supervisor was notified.

Authorized by/Date: Irina Carbone 4/8/2021

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0**Batch ID: P396024**

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4**Batch ID: P396106**

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4**Batch ID: P396106**

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L
Uranium	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1**Batch ID: P396035**

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1**Batch ID: P396037**

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P396026

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P396066

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P396061

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P396034

Component	Result	Code	Units
Total-P	0.005	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P396004

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2540 D-2011

Batch ID: P396104

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011

Batch ID: P396152

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P396106

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Chromium	93.7		P	85 - 115
Iron	104		P	85 - 115
Magnesium	99.2		P	85 - 115
Manganese	99.9		P	85 - 115
Potassium	103		P	85 - 115
Sodium	104		P	85 - 115
Strontium	96.9		P	85 - 115
Tin	97.1		P	85 - 115
Titanium	99.8		P	85 - 115
Vanadium	97.3		P	85 - 115
Zinc	92.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P396106

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.4		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	93.8		P	85 - 115
Boron	101		P	85 - 115
Cadmium	102		P	85 - 115
Cobalt	92.2		P	85 - 115
Copper	96.7		P	85 - 115
Lead	102		P	85 - 115
Molybdenum	101		P	85 - 115
Nickel	96.5		P	85 - 115
Selenium	88.4		P	85 - 115
Silver	101		P	85 - 115
Thallium	113		P	85 - 115
Uranium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P396035

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P396037

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P396026

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	101		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P396066

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	103		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P396061

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P396034

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P396004

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.2		P	90 - 110

Reference Method: SM 4500 F-C-2011

Batch ID: P396152

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	90 - 106

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P396106

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2236722	Chromium	87.6	87.2	P/P	70 - 130
2236722	Iron	100	101	P/P	70 - 130
2236722	Manganese	98.0	96.7	P/P	70 - 130
2236722	Tin	77.7	85.6	P/P	70 - 130
2236722	Titanium	101	101	P/P	70 - 130
2236722	Vanadium	101	99.8	P/P	70 - 130
2236722	Zinc	87.6	85.7	P/P	70 - 130
2237247	Chromium	91.6		P	70 - 130
2237247	Iron	102		P	70 - 130
2237247	Manganese	99.9		P	70 - 130
2237247	Tin	70.6		P	70 - 130
2237247	Titanium	104		P	70 - 130
2237247	Vanadium	103		P	70 - 130
2237247	Zinc	89.2		P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P396106

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2236722	Aluminum	126	126	P/P	70 - 130
2236722	Antimony	105	103	P/P	70 - 130
2236722	Arsenic	110	110	P/P	70 - 130
2236722	Beryllium	121	111	P/P	70 - 130
2236722	Cadmium	93.8	92.8	P/P	70 - 130
2236722	Cobalt	111	110	P/P	70 - 130
2236722	Copper	117	115	P/P	70 - 130
2236722	Lead	111	109	P/P	70 - 130
2236722	Molybdenum	118	115	P/P	70 - 130
2236722	Nickel	122	120	P/P	70 - 130
2236722	Selenium	91.9	91.7	P/P	70 - 130
2236722	Silver	92.7	91.2	P/P	70 - 130
2236722	Thallium	116	115	P/P	70 - 130
2236722	Uranium	123	122	P/P	70 - 130
2237247	Aluminum	130		P	70 - 130
2237247	Antimony	104		P	70 - 130
2237247	Arsenic	111		P	70 - 130
2237247	Beryllium	128		P	70 - 130
2237247	Cadmium	93.3		P	70 - 130
2237247	Cobalt	111		P	70 - 130
2237247	Copper	117		P	70 - 130
2237247	Lead	110		P	70 - 130
2237247	Molybdenum	119		P	70 - 130
2237247	Nickel	121		P	70 - 130
2237247	Selenium	95.4		P	70 - 130
2237247	Silver	91.5		P	70 - 130
2237247	Thallium	115		P	70 - 130
2237247	Uranium	123		P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P396035

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P396035

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2236660	Chloride	95.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P396037

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2236660	Sulfate	96.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P396026

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2236661	Ammonia-N	97.0	96.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P396061

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2236661	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396004

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2236662	O-Phosphate-P	99.0	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P396152

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2236660	Fluoride	98.6	100	P/P	94 - 107

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P396024

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236660	Turbidity	0.517	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P396106

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236722	Calcium	1.71	Spike	P	0 - 20
2236722	Chromium	0.359	Spike	P	0 - 20
2236722	Iron	0.110	Spike	P	0 - 20
2236722	Magnesium	0.0125	Spike	P	0 - 20
2236722	Manganese	1.43	Spike	P	0 - 20
2236722	Potassium	1.24	Spike	P	0 - 20
2236722	Sodium	0.314	Spike	P	0 - 20
2236722	Strontium	0.818	Spike	P	0 - 20
2236722	Tin	9.64	Spike	P	0 - 20
2236722	Titanium	0.552	Spike	P	0 - 20
2236722	Vanadium	0.952	Spike	P	0 - 20
2236722	Zinc	2.21	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P396106

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236722	Aluminum	0.308	Spike	P	0 - 20
2236722	Antimony	1.68	Spike	P	0 - 20
2236722	Arsenic	0.316	Spike	P	0 - 20
2236722	Beryllium	8.71	Spike	P	0 - 20
2236722	Boron	0.192	Spike	P	0 - 20
2236722	Cadmium	1.04	Spike	P	0 - 20
2236722	Cobalt	0.689	Spike	P	0 - 20
2236722	Copper	1.90	Spike	P	0 - 20
2236722	Lead	1.47	Spike	P	0 - 20
2236722	Molybdenum	1.44	Spike	P	0 - 20
2236722	Nickel	1.19	Spike	P	0 - 20
2236722	Selenium	0.302	Spike	P	0 - 20
2236722	Silver	1.64	Spike	P	0 - 20
2236722	Thallium	1.27	Spike	P	0 - 20
2236722	Uranium	1.04	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P396035

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236660	Chloride	0.723	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P396037

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236660	Sulfate	0.612	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P396026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236661	Ammonia-N	0.427	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P396066

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236661	Kjeldahl Nitrogen	3.26	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P396061

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236661	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P396034

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236661	Total-P	3.25	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P396004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236662	O-Phosphate-P	0.0795	Spike	P	0 - 20

Reference Method: SM 4500 F-C-2011
 Batch ID: P396152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2236660	Fluoride	0.902	Spike	P	0 - 2.8

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A104495

Included Lab Sample IDs: 2236660

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.2	98.8	P/P	90 - 110
Sulfate	96.7	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A104511

Included Lab Sample IDs: 2236662

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	99.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A104515

Included Lab Sample IDs: 2236660

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	99.5	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A104516

Included Lab Sample IDs: 2236661

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.6	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A104541

Included Lab Sample IDs: 2236661

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A104550

Included Lab Sample IDs: 2236661

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	105	106	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A104570

Included Lab Sample IDs: 2236660

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A104575

Included Lab Sample IDs: 2236661

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.4	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A104609

Included Lab Sample IDs: 2236663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	101	P/P	95 - 105
Chromium	98.3	96.4	P/P	95 - 105
Iron	102	101	P/P	95 - 105
Magnesium	97.2	96.0	P/P	95 - 105
Manganese	100	101	P/P	95 - 105
Potassium	104	103	P/P	95 - 105
Sodium	100	99.3	P/P	95 - 105
Strontium	98.0	99.7	P/P	95 - 105
Tin	95.4	94.4	P/P	95 - 105
Titanium	98.4	96.5	P/P	95 - 105
Vanadium	98.4	98.5	P/P	95 - 105
Zinc	96.2	93.9	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104632

Included Lab Sample IDs: 2236663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	106	107	P/P	90 - 110
Antimony	103	106	P/P	90 - 110
Arsenic	104	104	P/P	90 - 110
Beryllium	102	106	P/P	90 - 110
Boron	102	101	P/P	90 - 110
Cadmium	99.3	99.6	P/P	90 - 110
Cobalt	98.5	102	P/P	90 - 110
Copper	103	106	P/P	90 - 110
Lead	103	102	P/P	90 - 110
Molybdenum	101	101	P/P	90 - 110
Nickel	105	108	P/P	90 - 110
Selenium	102	105	P/P	90 - 110
Silver	100	100	P/P	90 - 110
Thallium	105	105	P/P	90 - 110
Uranium	99.8	98.6	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					0.517	
EPA 200.7 Rev. 4.4	Calcium	104					1.71
	Chromium	93.7	87.6	87.2	91.6		0.359
	Iron	104	100	101	102		0.110
	Magnesium	99.2					0.0125
	Manganese	99.9	98.0	96.7	99.9		1.43
	Potassium	103					1.24
	Sodium	104					0.314
	Strontium	96.9					0.818
	Tin	97.1	77.7	85.6	70.6		9.64
	Titanium	99.8	101	101	104		0.552
	Vanadium	97.3	101	99.8	103		0.952
	Zinc	92.6	87.6	85.7	89.2		2.21
EPA 200.8 Rev. 5.4	Aluminum	98.4	126	126	130		0.308
	Antimony	103	105	103	104		1.68
	Arsenic	102	110	110	111		0.316
	Beryllium	93.8	121	111	128		8.71
	Boron	101					0.192
	Cadmium	102	93.8	92.8	93.3		1.04
	Cobalt	92.2	111	110	111		0.689
	Copper	96.7	117	115	117		1.90
	Lead	102	111	109	110		1.47
	Molybdenum	101	118	115	119		1.44
	Nickel	96.5	122	120	121		1.19
	Selenium	88.4	91.9	91.7	95.4		0.302
	Silver	101	92.7	91.2	91.5		1.64
	Thallium	113	116	115	115		1.27
	Uranium	103	123	122	123		1.04
EPA 300.0 Rev. 2.1	Chloride	98.4	95.6			0.723	
	Sulfate	97.2	96.0			0.612	
EPA 350.1 Rev. 2.0	Ammonia-N	101	97.0	96.4			0.427
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103					3.26
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	100	101			0.487
EPA 365.1 Rev. 2.0	Total-P	107					3.25
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.2	99.0	99.1			0.0795
SM 4500 F-C-2011	Fluoride	99.8	98.6	100			0.902

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2236660
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2236663
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2236663
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2236660
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2236660
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2236661
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2236661
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2236661
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2236661
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2236662

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2236660
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2236660

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	04/06/2021			04/06/2021 17:38	Yen Ta	2236660
EPA 200.7 Rev. 4.4	04/06/2021	04/07/2021 16:10	Elliott D. Healy	04/09/2021 11:57	Betina Topolski	2236663
	04/06/2021	04/07/2021 16:10	Elliott D. Healy	04/09/2021 12:08	Betina Topolski	2236663
EPA 200.8 Rev. 5.4	04/06/2021	04/07/2021 16:10	Elliott D. Healy	04/09/2021 15:39	Alexander Thompson	2236663
	04/06/2021	04/07/2021 16:10	Elliott D. Healy	04/09/2021 19:00	Alexander Thompson	2236663
EPA 300.0 Rev. 2.1	04/06/2021			04/06/2021 16:02	Julia Storbeck	2236660
EPA 350.1 Rev. 2.0	04/06/2021			04/06/2021 17:15	Ping Hua	2236661
EPA 351.2 Rev. 2.0	04/06/2021	04/07/2021 13:05	Benjamin T. Nordmann	04/08/2021 11:55	Virginia P. Brown	2236661
EPA 353.2 Rev. 2.0	04/06/2021			04/07/2021 11:28	Beverly Y. Sanders	2236661
EPA 365.1 Rev. 2.0	04/06/2021	04/06/2021 20:10	Madeline Gruver	04/07/2021 12:55	Shengyu Ding	2236661
EPA 365.1 Rev. 2.0 dissolved	04/06/2021			04/06/2021 14:27	Lipi Saha	2236662
SM 2540 D-2011	04/06/2021			04/06/2021 15:05	Yijie Li	2236660
SM 4500 F-C-2011	04/06/2021			04/08/2021 07:22	Dale L. Simmons	2236660